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**Amendments to the Claims**

1. (currently amended) An optical modulator for encoding data on orthogonally polarized alternate light pulses comprising:

means for modifying a laser light beam to a pulse train at a first frequency;

a single data modulator for encoding signal data on the pulse train at a second data stream frequency where the second frequency is greater than or equal to the first frequency;

means for rotating a polarization state of at least alternate light pulses of the pulse train to provide a data stream of orthogonally polarized alternate light pulses.

2. (original) An optical modulator as defined in claim 1, wherein the means for modifying a laser light beam comprises a pulse generator for providing a pulse train of light pulses from a continuous wave laser beam.

3. (original) An optical modulator as defined in claim 2, wherein the pulse generator produces pulses at substantially 40 GHz.

4. (original) An optical modulator as defined in claim 2, wherein the means for rotating a polarization state of at least alternate light pulses includes means for directing alternate light pulses to a first optical path and a second optical path respectively, one of the first optical path and the second optical path including a polarization rotator for changing the polarization of light pulses passing therethrough, and means for combining orthogonally polarized light pulses from the first and second optical paths into a single data stream of alternate orthogonally polarized light pulses.

5. (original) An optical modulator as defined in claim 4, wherein the means for directing alternate light pulses to a first optical path and a second optical path is a driver electrically coupled to the pulse generator for synchronizing the means for directing alternate pulses to the frequency of the pulse train.

6. (original) An optical modulator as defined in claim 5, wherein the means for directing alternate light pulses to a first optical path and a second optical path comprises a narrow band Mach Zehnder having a single input port and a first and a second output port, and wherein the driver selects the first or the second output port for each light pulse.

7. (original) An optical modulator as defined in claim 6, wherein the first output port and the second output port are optically coupled to a polarization beam combiner through a half wave plate optically coupled to one of the first output port and the second output port, and through a spacer for providing an equal path length optically coupled to the other of the first output port and the second output port.

8. (original) An optical modulator as defined in claim 4, wherein the means for rotating a polarization state is disposed after the single data modulator in a light propagating direction.

9. (original) An optical modulator as defined in claim 1, wherein the data stream has a frequency greater than the first frequency of the pulse train.

10. (original) An optical modulator as defined in claim 1, wherein the data stream has a frequency equal to twice the frequency of the first frequency of the pulse train.

11. (original) An optical modulator as defined in claim 10, wherein the means for modifying a laser light beam comprises a pulse generator providing a pulse train at 20 GHz.

12. (original) An optical modulator as defined in claim 9, wherein the means for rotating a polarization state of at least alternate light pulses comprises a polarization delay line oriented to provide rotation of the polarization states of the train of pulses divided substantially equally between two orthogonal linear states, and for providing a delay of half the first frequency of the pulse train to one of the orthogonal linear states, and further

including means for combining and interleaving the pulses of the two orthogonal linear states to form a single pulse train having orthogonally polarized alternate light pulses.

13. (currently amended) An optical modulator as defined in claim 12, wherein the means for rotating a polarization state precedes the single data modulator in a light propagating direction.

14. (currently amended) An optical modulator as defined in claim 12, wherein the single data modulator includes driver means for encoding data on the alternate orthogonally polarized pulses of the light pulse train.

15. (currently amended) An optical modulator as defined in claim 14, wherein the single data modulator comprises a Mach Zehnder and the driver provides a different voltage $V\pi$ for pulses of different polarization.

16. (original) An integrated data modulator optical circuit comprising:

a laser light source;

a pulse generator comprising a first Mach-Zehnder device integrated on a substrate coupled to the laser light source for producing a pulse train;

a data modulator comprising a second Mach-Zehnder device integrated on the substrate for encoding data on the pulse train; and

means for interleaving alternate pulses of orthogonal polarization onto a single pulse train comprising a third Mach-Zehnder device integrated on the substrate for separating alternate pulses, further including a polarization rotator for rotating at least alternate pulses and a polarization combiner for interleaving alternate pulses.

17. (original) An integrated data modulator optical circuit as defined in claim 16 further including means for redirecting and focusing light from a first integrated device into a second integrated device on the same substrate.

18. (original) An integrated data modulator optical circuit as defined in claim 17, wherein the means for redirecting and focusing light comprises a graded index lens optically coupled at a first end to the substrate symmetrically disposed between the first integrated device and the second integrated device, and having a reflective element at a second end thereof.

19. (currently amended) A method of encoding data on a light pulse train of alternate polarization interleaved bits comprising the steps of:

providing a single pulse train of light pulses at a first frequency;

encoding data on the single pulse train at a second data stream frequency where the second frequency is greater than or equal to the first frequency;

passing at least alternate pulses through a polarization rotator to rotate alternate pulses to orthogonal polarization states; and

interleaving the orthogonally polarized pulses, for transmission in an optical system.

20. (original) A method of encoding data as defined in claim 19, wherein the step of passing at least alternate pulses through a polarization rotator comprises passing alternate pulses, in dependence upon a clock synchronized with the pulse train, through a polarization rotator.

21. (currently amended) A method of encoding data as defined in claim 19 ~~17~~, wherein the step of interleaving the orthogonally polarized pulses comprises interleaving the alternate pulses from the polarization rotator with alternate pulses which did not pass through the polarization rotator.

22. (currently amended) A method of encoding data as defined in claim 21 ~~16~~, wherein the first frequency is half a frequency of the interleaved pulses and orthogonally polarized pulses are interleaved prior to encoding data on the pulse train.